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CLAIMS

1. A photocured crosslinked-hyaluronic acid gel, which has a storage modulus (G') of from 50 to 1500 Pa, a loss modulus (G") of from 10 to 300 Pa, and a tangent delta (G"/G') of from 0.1 to 0.8 in dynamic viscoelasticity measured by a rheometer under the following conditions,

method of measurement:

oscillation test method, stress control

measuring temperature: 37°C

measuring geometry: 4 cm

gap: 800 μm

frequency: 10 Hz, and

which is a hydrogel obtained by irradiation with ultraviolet rays of a photoreactive hyaluronic acid derivative in which a photoreactive crosslinking group is chemically linked to a functional group of the hyaluronic acid and crosslinking of mutual photoreactive crosslinking groups.

2. The photocured crosslinked-hyaluronic acid ~~gel~~, which has a crosslinking extent of from 0.01 to 0.5% per mole of a constituent disaccharide unit of hyaluronic acid, ~~and~~

~~which is a hydrogel obtained by irradiation with ultraviolet rays of a photoreactive hyaluronic acid derivative in which a photoreactive crosslinking group is chemically~~

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~~linked to a functional group of the hyaluronic acid and crosslinking of mutual photoreactive crosslinking groups.~~

3. The photocured crosslinked-hyaluronic acid ~~gel~~, which has a water absorption of 2,000 to 15,000% as defined as follows:

water absorption (%) = weight of absorbed water /weight of dried gel × 100, and

~~which is a hydrogel obtained by irradiation with ultraviolet rays of a photoreactive hyaluronic acid derivative in which a photoreactive crosslinking group is chemically linked to a functional group of the hyaluronic acid and crosslinking of mutual photoreactive crosslinking groups.~~

4. The photocured crosslinked-hyaluronic acid gel according to any one of claims 1 to 3,

wherein said photoreactive crosslinking group is a cinnamic acid derivative containing a spacer and chemically links to a functional group of hyaluronic acid to afford said photoreactive hyaluronic acid derivative;

said mutual photoreactive crosslinking groups of said photoreactive hyaluronic acid derivative are dimerized by irradiation with ultraviolet rays to form a cyclobutane ring and to thereby form a network structure; and

said gel is a hydrogel containing an aqueous medium in said network structure.

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4. The photocured crosslinked-hyaluronic acid hydrogel ~~gel~~ according to claim 1, wherein said spacer is a group derived from an amino alcohol, an amino acid or a peptide.

5. The photocured crosslinked-hyaluronic acid hydrogel ~~gel~~ according to claim 1 ~~or 5,~~ wherein said photoreactive crosslinking group is represented by the following formula (1) or (2):

$$-NH(CR^1R^2)_nOCOCH=CH-Ph \quad (1)$$

wherein R^1 and R^2 each independently represents a hydrogen atom or an alkyl group having from 1 to 8 carbon atoms; Ph represents a phenyl group; and n represents an integer of from 2 to 18;

$$-A-NH-Ph-CH=CHCOOR^3 \quad (2)$$

wherein R^3 represents an alkyl group having from 1 to 8 carbon atoms or an aralkyl group; A represents $-(NHCR^4R^5CO)_m-$ or $-NH(CR^4R^5)_hCO-$; R^4 and R^5 each independently represents a hydrogen atom or an alkyl group having from 1 to 8 carbon atoms; -Ph- represents a para-phenylene group; m represents an integer of from 1 to 6; and h represents an integer of from 1 to 18.

6. The photocured crosslinked-hyaluronic acid hydrogel ~~gel~~ according to claim 1 ~~any one of claims 1 to 6~~, wherein said

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photoreactive crosslinking group is introduced in a proportion of from 0.05 to 10% per mole of a constituent disaccharide unit.

17. A photocured crosslinked-hyaluronic acid ~~gel~~ hydrogel, which has a storage modulus (G') of from 50 to 1500 Pa, a loss modulus (G") of from 10 to 300 Pa, and a tangent delta (G"/G') of from 0.1 to 0.8 in dynamic viscoelasticity measured by a rheometer under the following conditions,

method of measurement:

oscillation test method, stress control

measuring temperature: 37°C

measuring geometry: 4 cm

gap: 800 μm

frequency: 10 Hz, and

which is a hydrogel obtained by irradiation with ultraviolet rays of a photoreactive hyaluronic acid derivative in which a photoreactive crosslinking group is chemically linked to a functional group of the hyaluronic acid and crosslinking of mutual photoreactive crosslinking groups and then by a heat treatment of the crosslinked product.

18. A photocured crosslinked-hyaluronic acid ~~gel~~ hydrogel, which has a storage modulus (G') of from 50 to 1500 Pa, a loss modulus (G") of from 10 to 300 Pa, and a tangent delta (G"/G') of from 0.1 to 0.8 in dynamic viscoelasticity measured by a rheometer under the following conditions,

method of measurement:

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oscillation test method, stress control

measuring temperature: 37°C

measuring geometry: 4 cm

gap: 800 μm

frequency: 10 Hz, and

which is a hydrogel obtained by a heat treatment of a photoreactive hyaluronic acid derivative in which a photoreactive crosslinking group is chemically linked to a functional group of the hyaluronic acid, and then by irradiation with the ultraviolet rays of the heated photoreactive hyaluronic acid derivative and crosslinking of mutual photoreactive crosslinking groups.

9. A photocured crosslinked-hyaluronic acid hydrogel, which has a storage modulus (G') of from 50 to 1500 Pa, a loss modulus (G") of from 10 to 300 Pa, and a tangent delta (G"/G') of from 0.1 to 0.8 in dynamic viscoelasticity measured by a rheometer under the following conditions,

method of measurement:

oscillation test method, stress control

measuring temperature: 37°C

measuring geometry: 4 cm

gap: 800 μm

frequency: 10 Hz, and

which is a hydrogel obtained by a heat treatment of a photoreactive hyaluronic acid derivative in which a photoreactive crosslinking group is chemically linked to a

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functional group of the hyaluronic acid, and then by irradiation with ultraviolet rays of the heated photoreactive hyaluronic acid derivative and crosslinking of mutual photoreactive crosslinking groups, and then by a heat treatment of the crosslinked product again.

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~~11~~. The photocured crosslinked-hyaluronic acid gel according to claims 1, 9, 9a and 10 ~~any one of claims 1 to 10~~, wherein the endotoxin content of the gel is 0.25 endotoxin unit (EU)/g or less.

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~~12~~. A method for preparing a photocured crosslinked-hyaluronic acid hydrogel ~~gel~~ comprising:

irradiating with ultraviolet rays an aqueous medium solution containing from 0.5 to 10% by weight photoreactive hyaluronic acid derivative in which a photoreactive crosslinking group is chemically linked to a functional group of the hyaluronic acid; and

forming an intermolecular and/or intramolecular crosslinking by dimerization of the mutual photoreactive crosslinking groups to provide a network structure.

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~~13~~. The method for preparing a photocured crosslinked-hyaluronic acid hydrogel ~~gel~~ according to claim 11, wherein a heat treatment is conducted before and/or after irradiation with ultraviolet rays of said aqueous medium solution of the photoreactive hyaluronic acid derivative.

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~~14~~. The method for preparing a photocured crosslinked-hyaluronic acid gel according to claim 13, wherein said heat

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treatment is conducted at from 100 to 125°C for from 5 to 30 minutes with high pressure steam.

14. A biomedical material comprising the photocured crosslinked-hyaluronic acid ~~gel~~ hydrogel according to any one of claims ~~1 to 11~~ 1, 8, 9 and 10.

15. The biomedical material according to claim ~~14~~, which has an antiadhesive effect.

17. A biomedical material kit comprising a crosslinked hyaluronic acid gel and a container containing said gel in such a state that it can be taken out.

18. The biomedical material kit according to claim 17, wherein said container is a container which can push out said gel for injection.

16. A biomedical material kit comprising the photocured crosslinked-hyaluronic acid ~~gel~~ hydrogel as described in any one of claims ~~1 to 11~~ 1, 8, 9 and 10 and a container containing said ~~gel~~ hydrogel in such a state that it can be taken out.

17. The biomedical material kit according to claim ~~16~~, wherein said container is a container which can push out said ~~gel~~ hydrogel for injection.

add claim 7